LABORATORIOS DE FABRICACIÓN DIGITAL (MAKER LABS) COMO CENTROS DIGITALES DE DESARROLLO DE LA CREATIVIDAD E INNOVACIÓN PARA EMPRENDEDORES

Horacio Mayorca

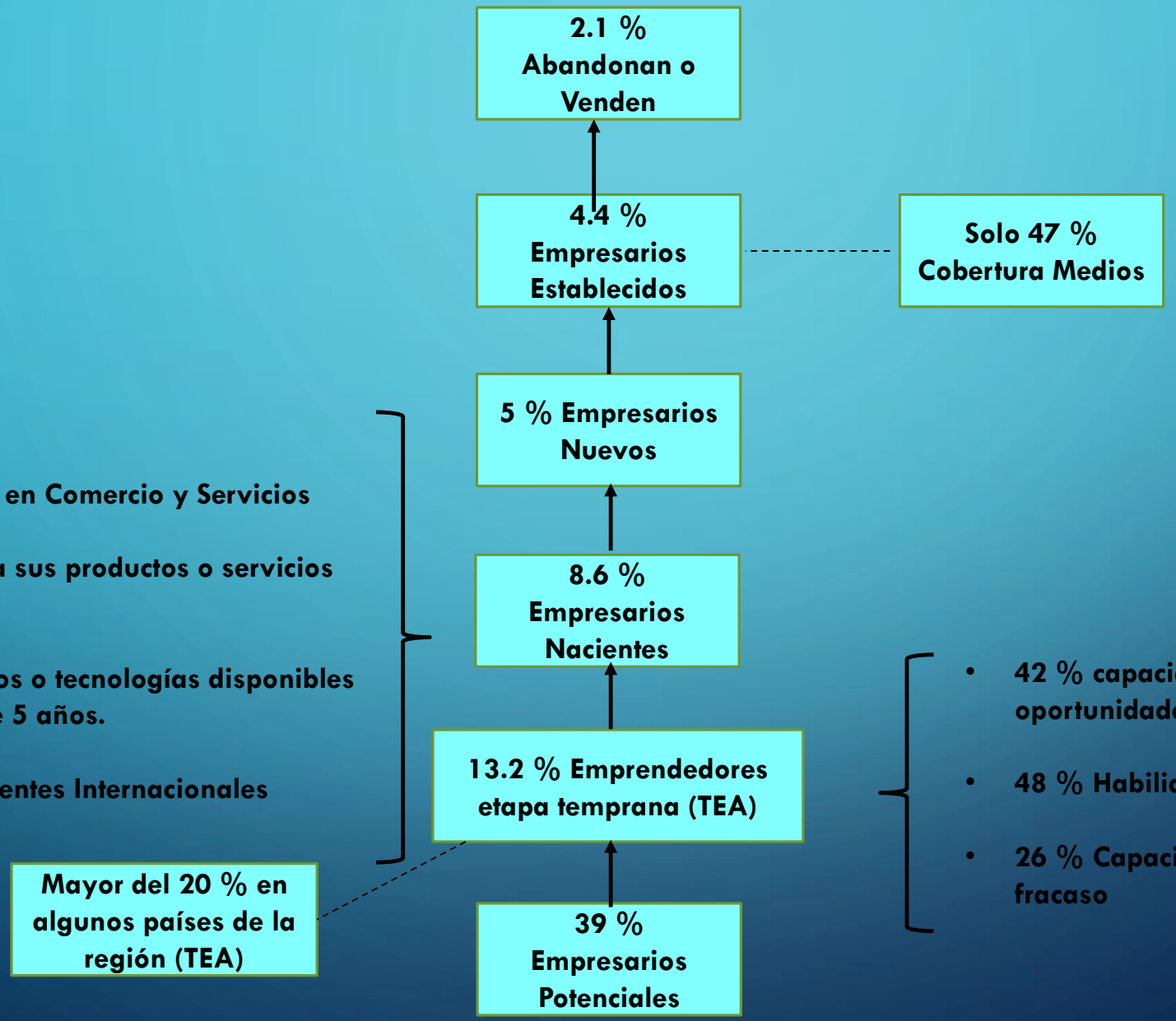
OBJETIVO DE LA INVESTIGACIÓN

- **Identificar las oportunidades que ofrecen los Maker Labs en el desarrollo de los emprendedores.**

Objetivos específicos:

- Determinar cómo los Maker Labs contribuyen al desarrollo de los emprendedores.
- Identificar los aportes de la elaboración de prototipos como herramientas fundamentales en el desarrollo del emprendimiento.
- Investigar las tecnologías digitales e Identificar oportunidades de negocios para los emprendedores basados en la Cuarta Revolución Industrial.

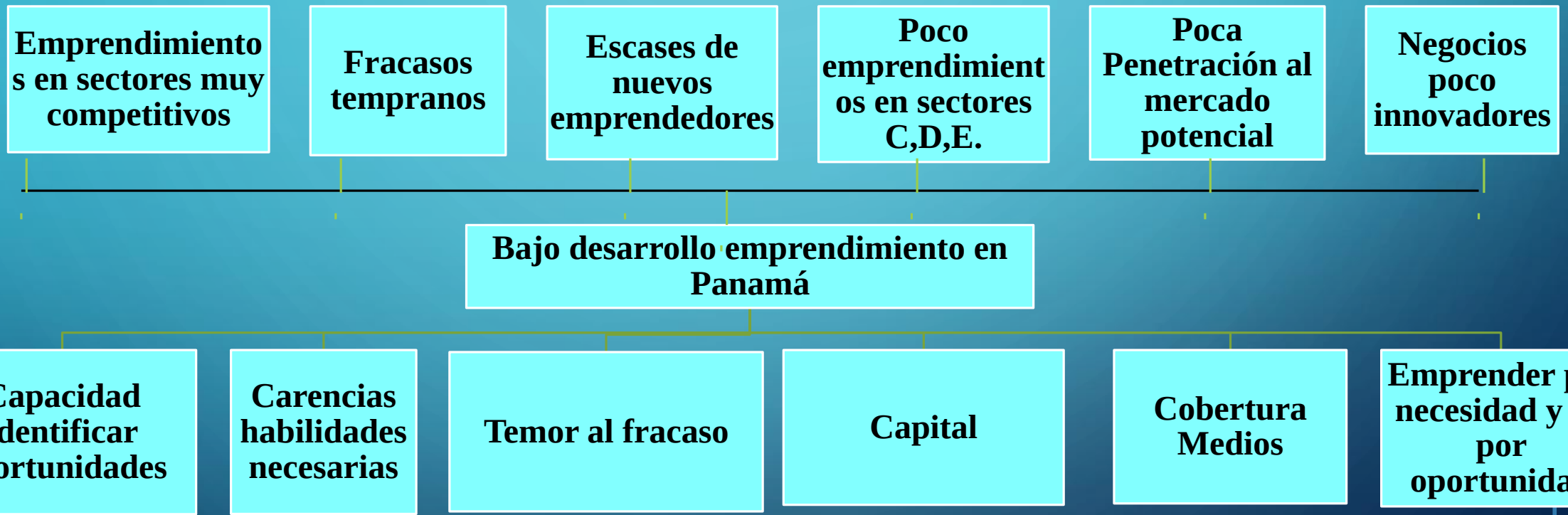
ESTUDIO GEM PANAMÁ (2016)



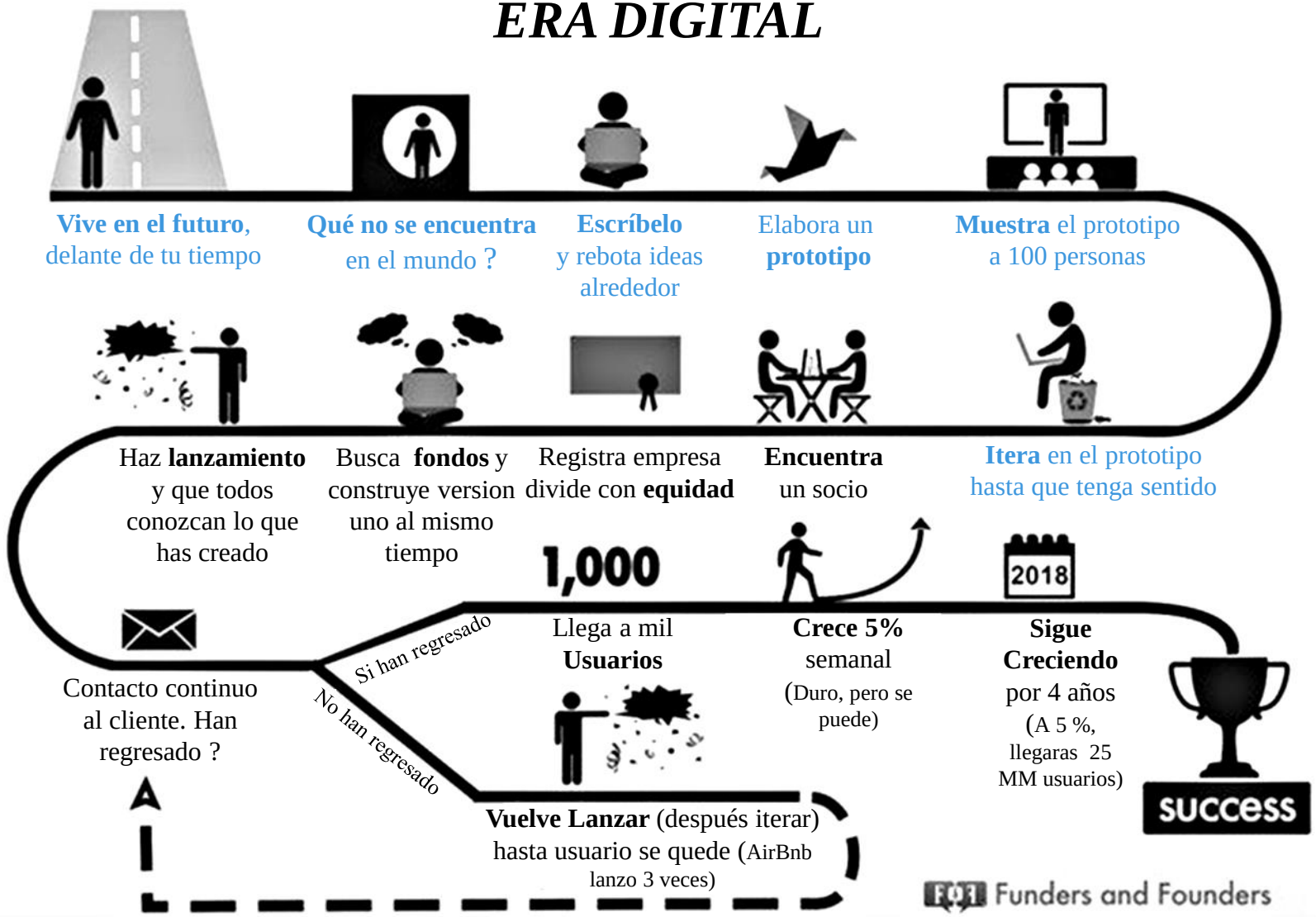
- 82 % Se concentra en Comercio y Servicios
- 55 % No considera sus productos o servicios como Innovadores
- 61 % Usan procesos o tecnologías disponibles desde hace mas de 5 años.
- Solo 36 % tiene clientes Internacionales

- 42 % capacidad Identificar oportunidades empresariales
- 48 % Habilidades necesarias
- 26 % Capacidad superar el temor al fracaso

Arbol de Problemas



COMO EMPEZAR UNA EMPRESA ERA DIGITAL



TECNOLOGÍAS DIGITALES – 4TA. REVOLUCIÓN INDUSTRIAL

- Tercera Revolución Industrial la cual se basaba en el uso de electrónica y tecnología de información para automatizar la producción.
- Cuarta Revolución Industrial, se construye sobre la anterior, pero se caracteriza por la fusión de tecnologías que están borrando la línea entre el mundo físico, digital y biológico.

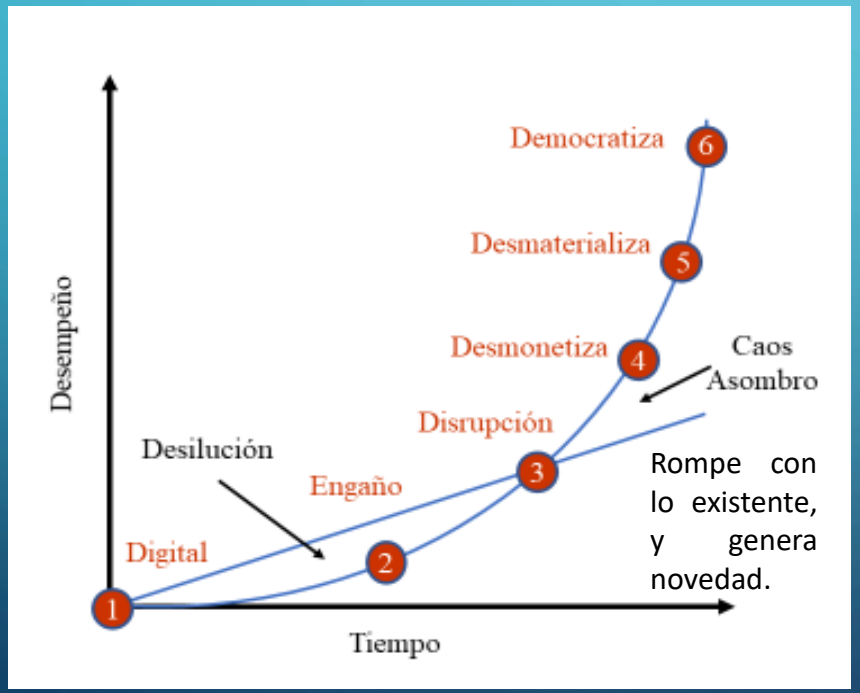
Tres características únicas son: velocidad, alcance e impacto en los sistemas.

CRECIMIENTO EXPONENCIAL Y DISRUPCIÓN

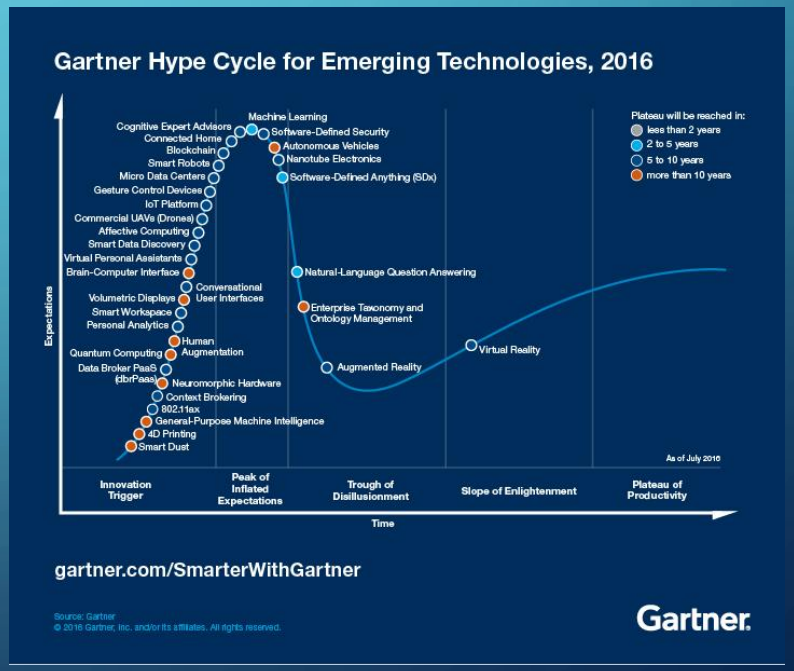
LINEAL Vs. EXPONENCIAL

El presente-futuro se está desarrollando de manera exponencial. Preverlo es un reto, porque el veloz ritmo del progreso tecnológico suele sorprendernos. Necesitamos entrenar y trabajar a fondo el concepto de Ejecutivo y Líder Exponencial.

Hacer algo nuevo o diferente. Crear soluciones a hechos futuros (no existentes) y crear o pensar en el apoyo tecnológica requerido aun cuando no exista.



Rompe con lo existente, y genera novedad.



TECNOLOGÍAS DISRUPTIVAS

The Essential Eight technologies and how they can be applied

Blockchain

Distributed electronic ledger that uses software algorithms to record and confirm transactions with reliability and anonymity. The record of events is shared between many parties and information once entered cannot be altered, as the downstream chain reinforces upstream transactions.

Example Use Cases

- Identity management
- Voting
- Peer to peer transactions
- Supply chain management
- Smart contracting
- Provenance / traceability
- Asset registration / ownership
- Trade finance
- Record management

Drones

Air- or water-based devices and vehicles, for example, Unmanned Aerial Vehicles (UAV), that fly or move without an onboard human pilot. Drones can operate autonomously (via on-board computers) on a predefined flight plan or be controlled remotely.

Example Use Cases

- Insurance claim validation
- Precision farming
- Infrastructure inspections
- Railway safety
- Cargo delivery
- Construction site management
- Forestry management
- Facility inspection (wind turbine, oil rig, etc)

Internet of Things (IoT)

Network of objects – devices, vehicles, etc. – embedded with sensors, software, network connectivity and compute capability, that can collect and exchange data over the Internet. IoT enables devices to be connected and remotely monitored or controlled. The term IoT has come to represent any device that is now "connected" and accessible via a network connection. The Industrial IoT is a subset of IoT and refers to its use in manufacturing and industrial sectors.

Example Use Cases

- Inventory and material tracking
- Real-time asset monitoring
- Connected operational intelligence
- Customer self-service
- Usage and performance benchmarking
- Data integration and analytics
- Connected service parts management
- Remote service
- Real time market insights
- Flexible billing and pricing models

Robots

Electro-mechanical machines or virtual agents that automate, augment or assist human activities, autonomously or according to a set of instructions – often a computer program.

Example Use Cases

- Manufacturing
- Hazardous industries
- Hotels and tourism
- Service industry
- Automation of predictable tasks
- Data management

 source pwc via @mikequindazzi

3D Printing

Additive manufacturing techniques used to create three-dimensional objects based on digital models by layering or "printing" successive layers of materials. 3D printing relies on innovative "inks" including plastic, and more recently, glass and wood.

Example Use Cases

- Healthcare and smart medical devices
- Tools and end use parts
- Prototyping
- Bridge manufacturing
- Supply chain optimization
- Customized products
- Remote location production

Virtual reality (VR)

Computer-generated simulation of a three dimensional image or a complete environment, within a defined and contained space, that viewers can interact with in realistic ways. VR is intended to be an immersive experience and typically requires equipment, most commonly a helmet/headset.

Example Use Cases

- Immersive journalism
- Virtual workplaces
- Manufacturing/product design
- Architecture & construction
- Education&training
- Big data management
- Entertainment
- Healthcare
- Merchandising

Augmented Reality (AR)

Addition of information or visuals to the physical world, via a graphics and/or audio overlay, to improve the user experience for a task or a product. This "augmentation" of the real world is achieved via supplemental devices that render and display said information.

Example Use Cases

- Virtual showrooms
- Education
- Travel and tourism
- Gaming
- Printing and advertisers
- Retail environments
- Marketing

Artificial intelligence (AI)

Software algorithms that are capable of performing tasks that normally require human intelligence, such as visual perception, speech recognition, decision-making and language translation. AI is an "umbrealla" concept that is made up of numerous subfields, such as machine learning, which focuses on the development of programs that can teach themselves to learn, understand, reason, plan, and act (i.e. become more intelligent) when exposed to new data in the right quantities.

Example Use Cases

- Managing personal finances
- Trading systems
- Real time fraud and risk management
- Automated virtual assistants
- Underwriting loans and insurance
- Customer support, transactions and helpdesks
- Data analysis and advanced analytics

List of Exponential Technologies (We Will Discuss Top 8)

- Artificial Intelligence
- Space
- Robotics
- Energy (energy storage)
- Autonomous Vehicle
- Gene Sequencing
- Digital Biology
- VR & AR
- IOT
- Cloud Computing
- Digital Currency
- 3D Printing
- NanoTechnology
- Solar
- Medical Devices
- Quantitative Computing

Big Data, Artificial Intelligence
Cognitive capabilities that can augment or replicate human thinking

Robotics
Next generation robotics/automation technologies to work with humans

Biotechnology & Bioinformatics
Digitization of the genome + ability reprogram DNA for new therapies

Energy & Environmental Systems
Greater cost effective management of inputs/outputs than ever before

Digital Mftg. & Nanotechnology
3D printing and digital design digitize product creation and distribution

Computation, Networks & Sensors[1]
Increased speed, declining costs of computation, networking, and sensing

Digital Medicine
Increasing the sensing capabilities focused around the human body

Convergence

Though individually powerful, the real power of exponentials lies in their convergence – when different technologies merge into a new, unified whole.

Crowdsourcing & Micro-work
Leveraging communities to achieve a specific goal

Crowdfunding
Leveraging the public to fund the creation of a product or company

Incentive Competitions
Prize-based competitions to engage the community to solve a problem

DIY & the Maker Movement
Creative potential unlocked when the public can make their own items

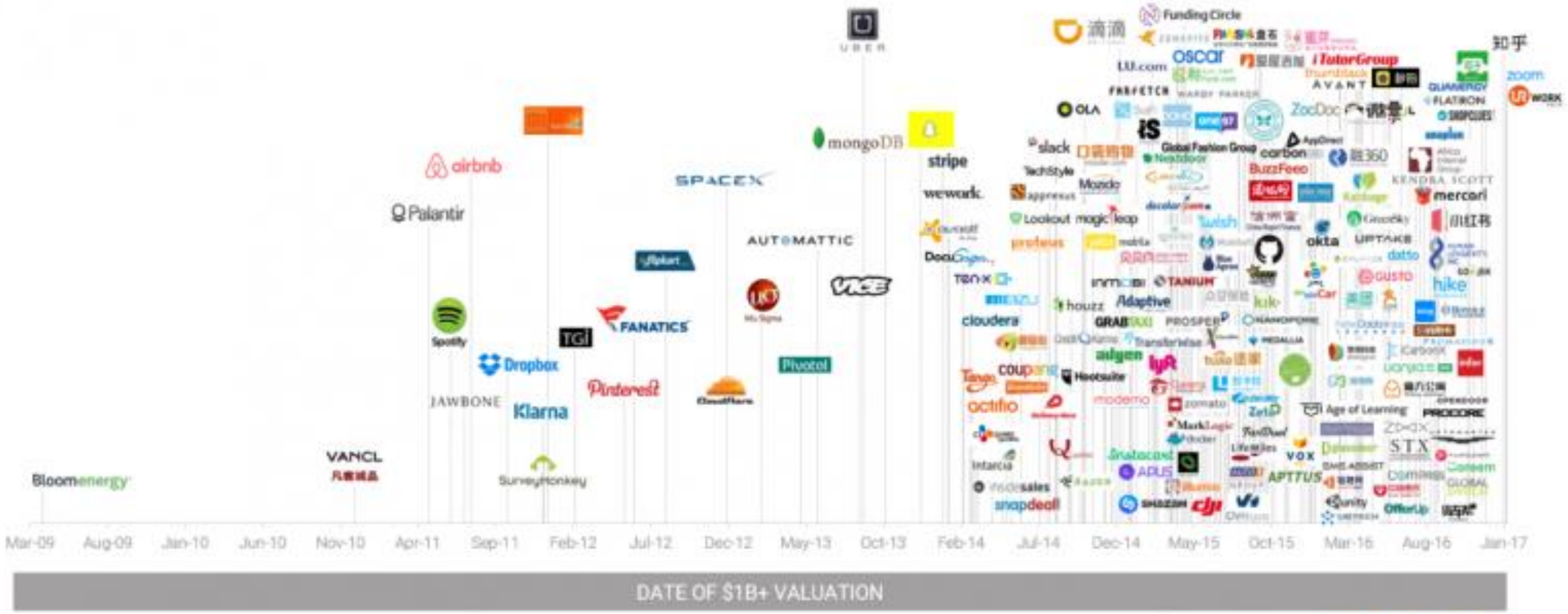
Digital Economies/Blockchain
Crypto-currency, mobile payments, and other economic innovations

Gamification
Leveraging game mechanics to incentivize specific behaviors

Sharing and Social Economy
An economic model that focuses on community and sharing

THE INCREASINGLY CROWDED UNICORN CLUB: PRIVATE COMPANIES VALUED AT $1B+

as of 1/31/2017



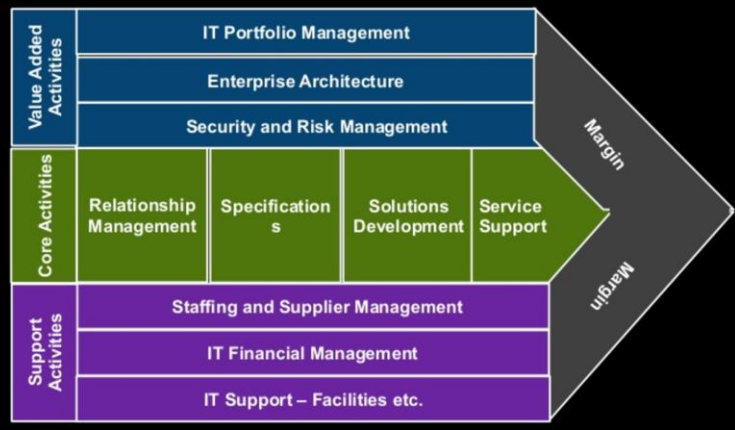
CBINSIGHTS

¿QUE HACE UN LABORATORIO DE FABRICACIÓN DIGITAL?

- *Muy Simple, Brindamos herramientas tecnológicas al alcance de las comunidades e individuos.*
- Se combina equipos de fabricación, comunidad y educación que permita a los miembros el diseñar, realizar prototipos y desarrollar proyectos que serían imposibles de realizar si se trabaja en solitario.

Lean	Traditional
Strategy	
Business Model Hypothesis-driven	Business Plan Implementation-driven
New-Product Process	
Customer Development Get out of the office and test hypotheses	Product Management Prepare offering for market following a linear, step-by-step plan
Engineering	
Agile Development Build the product iteratively and incrementally	Agile or Waterfall Development Build the product iteratively, or fully specify the product before building it
Organization	
Customer and Agile Development Teams Hire for learning, nimbleness, and speed	Departments by Function Hire for experience and ability to execute
Financial Reporting	
Metrics That Matter Customer acquisition cost, lifetime customer value, churn, viralness	Accounting Income statement, balance sheet, cash flow statement
Failure	
Expected Fix by iterating on ideas and pivoting away from ones that don't work	Exception Fix by firing executives
Speed	
Rapid Operates on good-enough data	Measured Operates on complete data

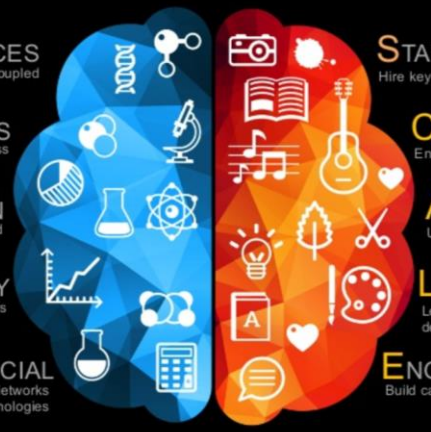
Today's IT Playbook



1. Standardization
2. Centralized Control
3. Specialized Skills
4. Agile Methods
5. Automation
6. Efficiency
7. Outsourcing

This model was designed for "Turn of Century" problems

ExO's are enabled by key capabilities



INTERFACES
Open and Loosely Coupled

DASHBOARDS
Manage ecosystem effectiveness

EXPERIMENTATION
Quick, effective and externally focused

AUTONOMY
Empower employees and partners

SOCIAL
Real-time, Bidirectional, Informal Networks and Social Technologies

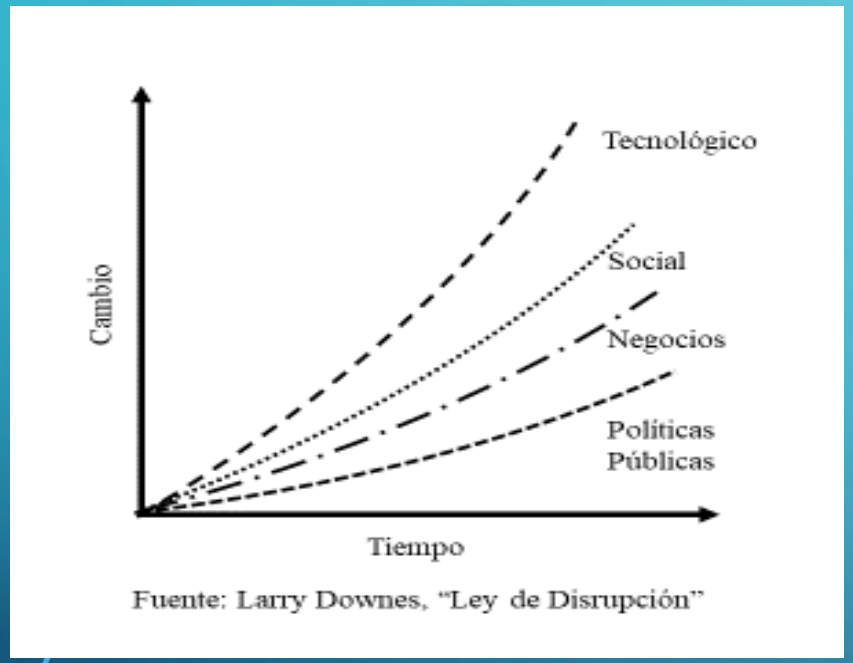
STAFF ON DEMAND
Hire key skills, rent others based on demand

CROWDSOURCING
Engage the external ecosystem in core business processes

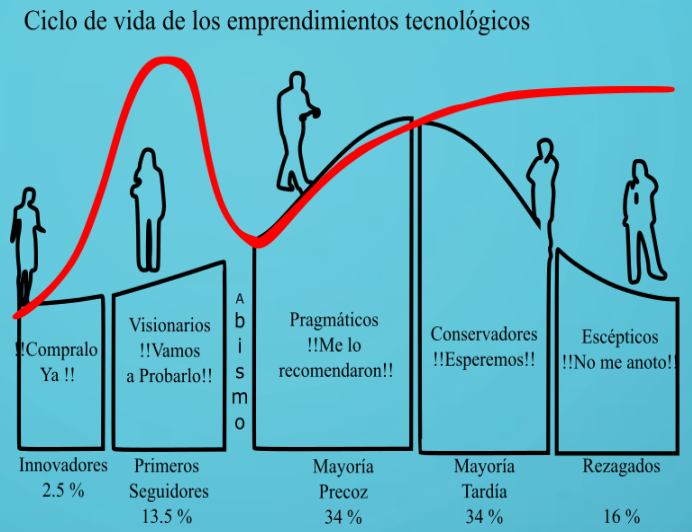
ALGORITHMS
Unique, differentiated, insight driven algorithms

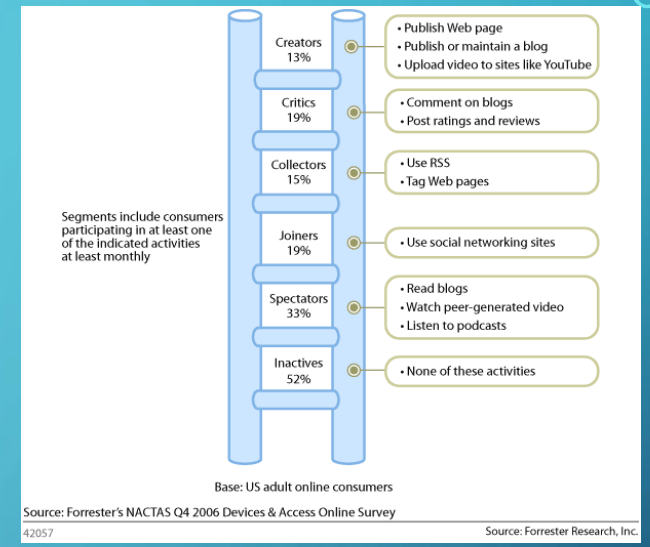
LEVERAGED ASSETS
Leverage assets, use scale to drive costs based on demand and usage

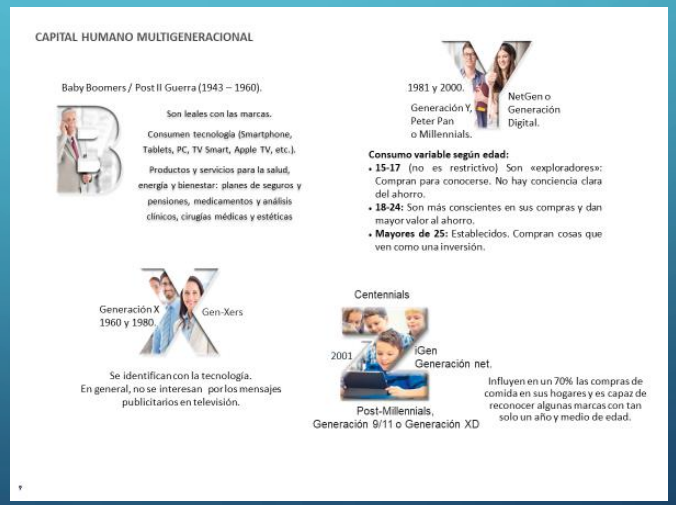
ENGAGEMENT
Build capabilities by engaging and Integrating across the ecosystem



Fuente: Larry Downes, "Ley de Disrupción"



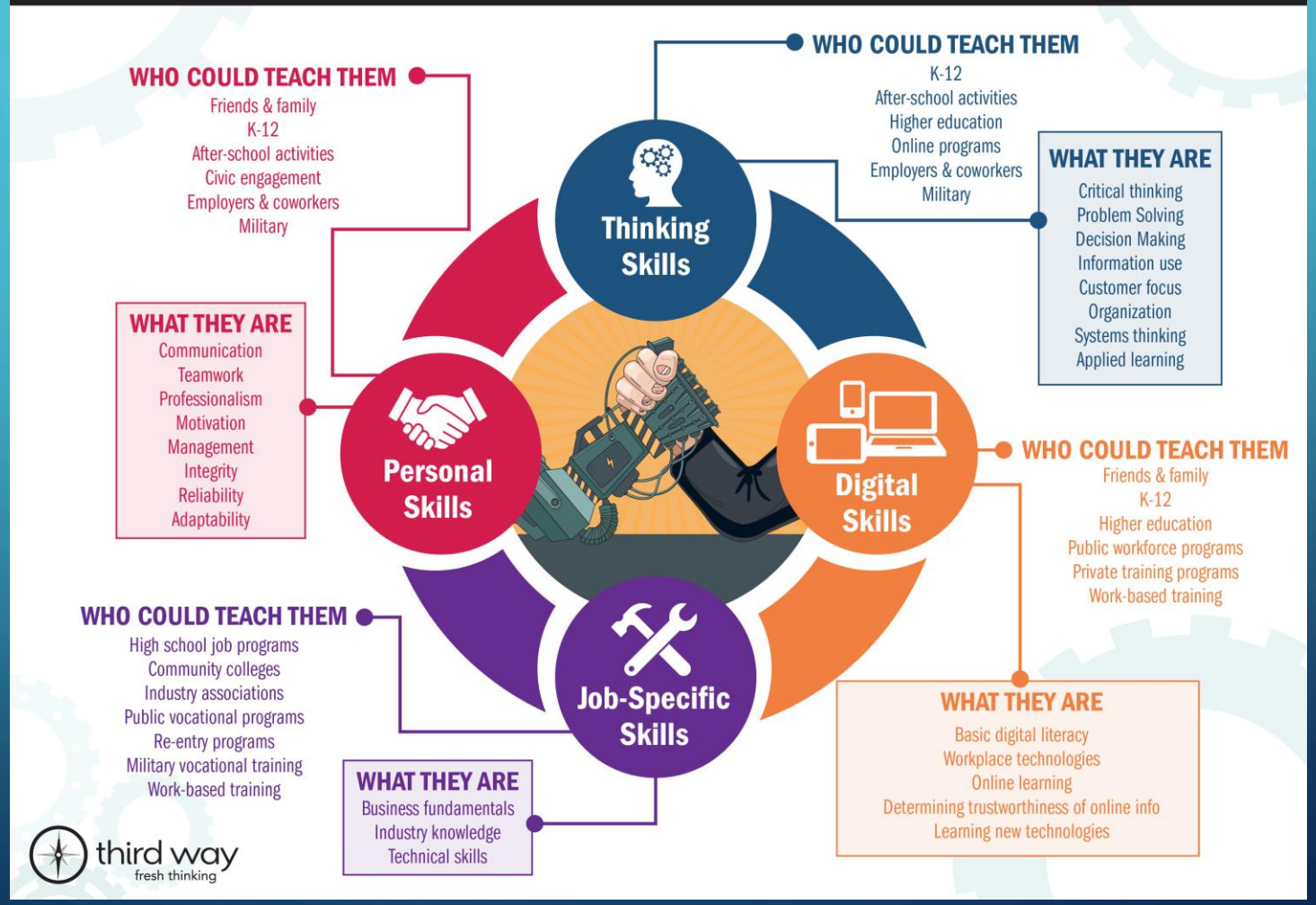




AUTOMATE THIS

The Skills People Need to Compete in the Digital Economy, and Who Could Teach Them

The coming wave of automation does not mean we need to do away with the concept of working for a living—it means we need to upskill our workforce so Americans can compete and succeed in the new economy. We need to leverage the many places people learn to ensure workers develop the four types of skills they'll need to face off with robots—and win.



Discover + Define

I Have a Challenge.

Service Learning is an essential component of 21st Century Ed. How might my school's service program better teach leadership, 21st Century skills, cultural/social sensitivity, and citizenship?

How Do I Approach It?

Empathize, observe, and immerse. Ask yourself questions like:

- What needs to change, and how much? What can change?
- Who's involved in a service learning program? How do they think, and why? What do they want and need to get out of the experience? Dig deep!

Interpret + Synthesize

I Learned Something.

Understand the current context of service in your school and where it fits into your school's mission. Consider organizing your information by points of view and the insights you learned from specific groups.

How Do I Interpret It?

Analyze what you've learned about the problem, where service takes place, and who participates.

- Use personas and role-playing activities
- Create "(User) Needs to (Verb) Because..." statements. Observe and intuit.

Ideate

I See an Opportunity.

Use what data you've gathered to inform your brainstorming. Abandon the obvious solutions and reframe if necessary. Strive for volume and variety.

What Do I Create?

Brainstorm with your team and administration. Choose constraints and then remove them to enrich your ideas.

Experiment

I Have an Idea. **How Do I Build It?**

Create a prototype of your service program: choose its structure, systems, and events. Use different user groups' points of view to "test drive" the program.

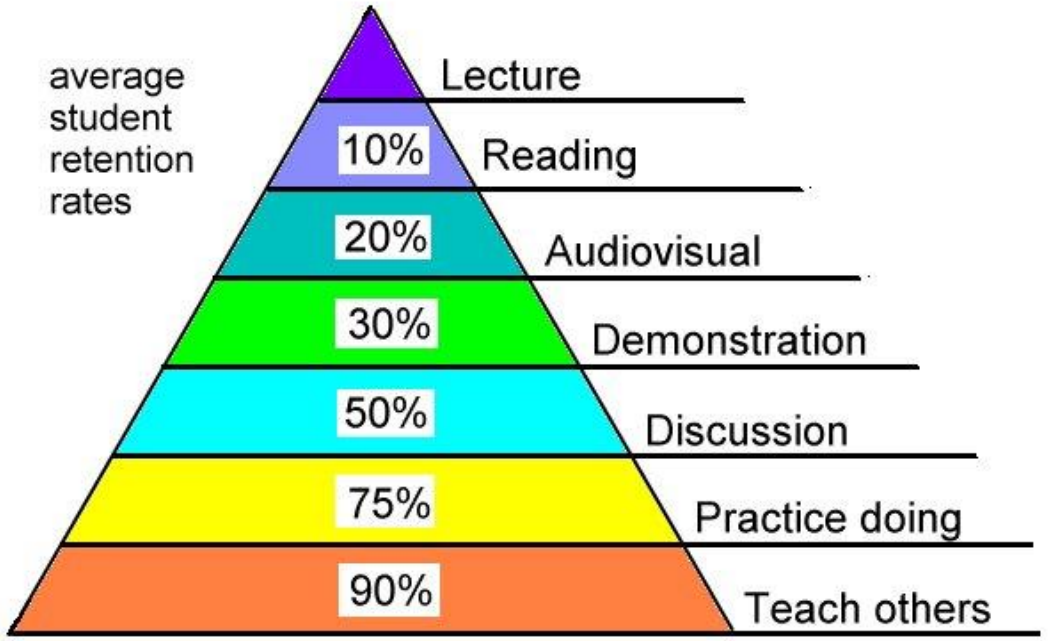
Test + Evolve

I Tried Something.
How Do I Evolve It?

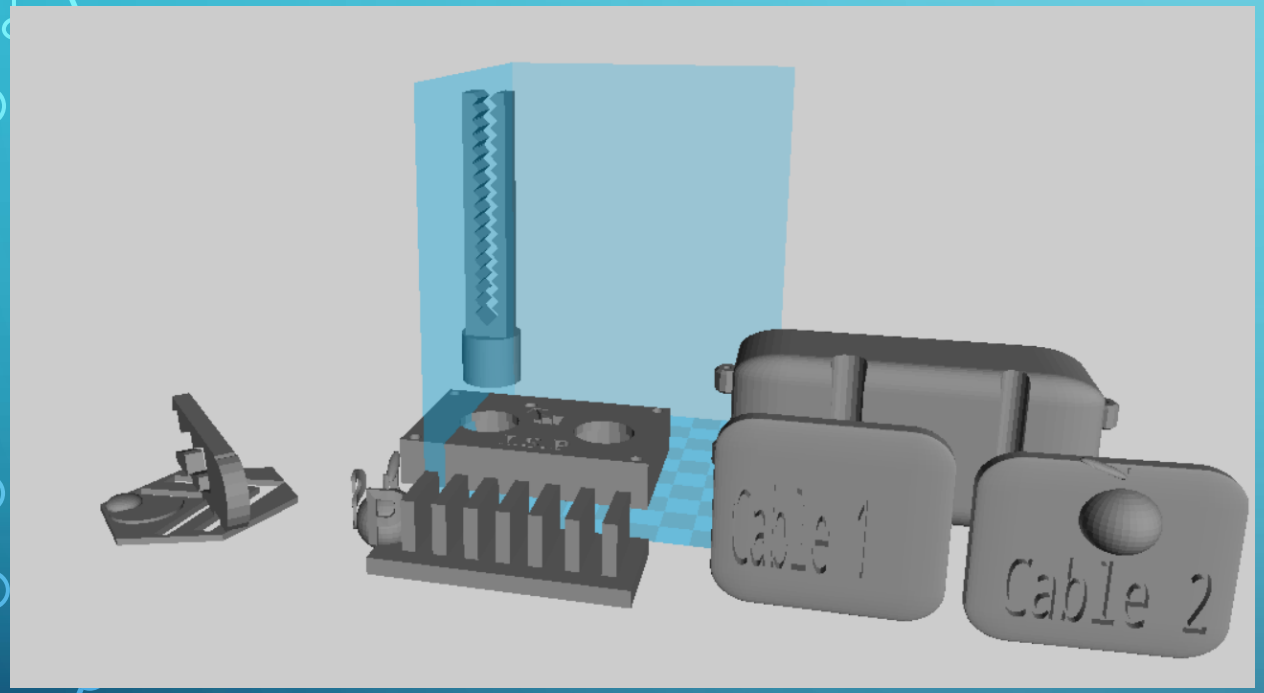
Try your new idea for a particular event, week, month, semester, or year. Analyze everything critically, even what seems to be "working." Gather as much feedback from as many stakeholders and users as possible. Use "what if" statements. Be mindful and continue to tweak and experiment with alternatives.

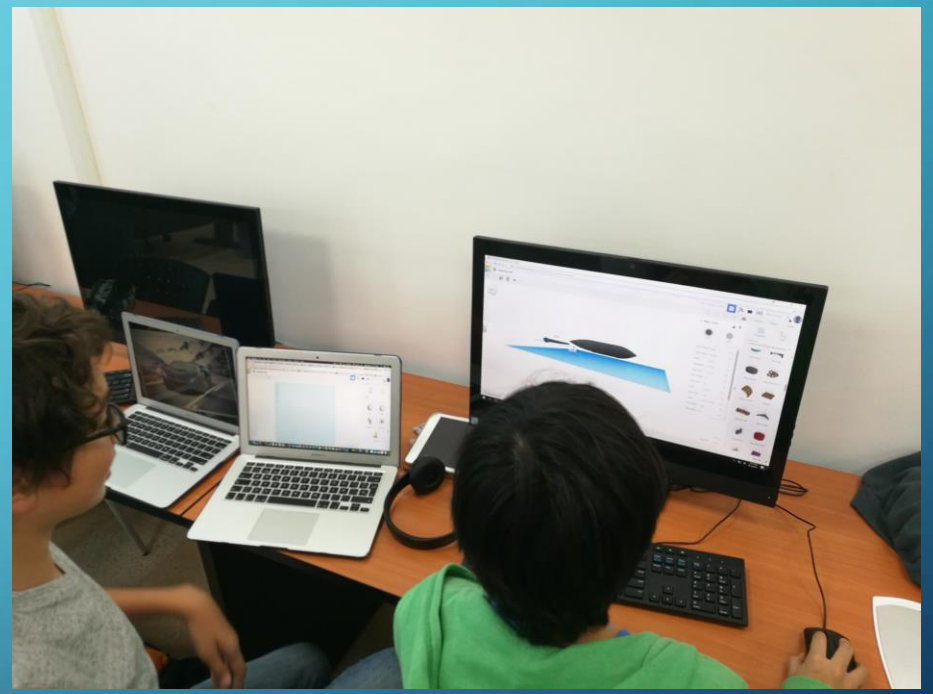
CS&A

Learning Pyramid

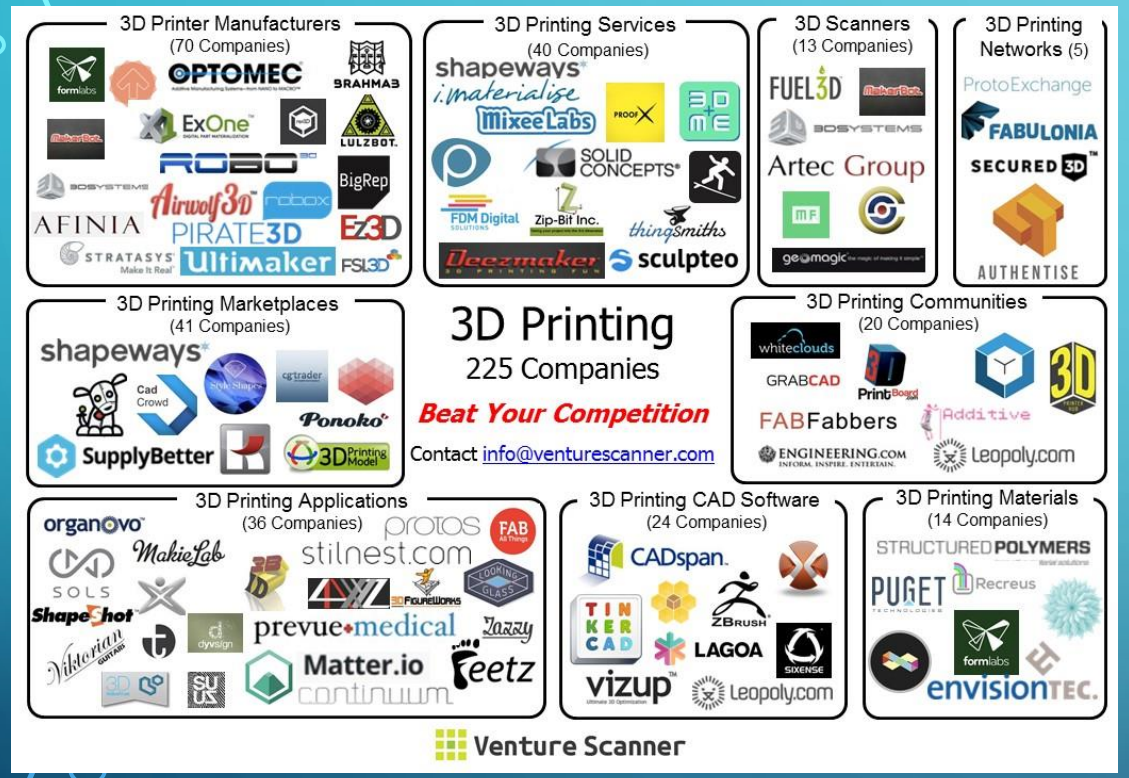


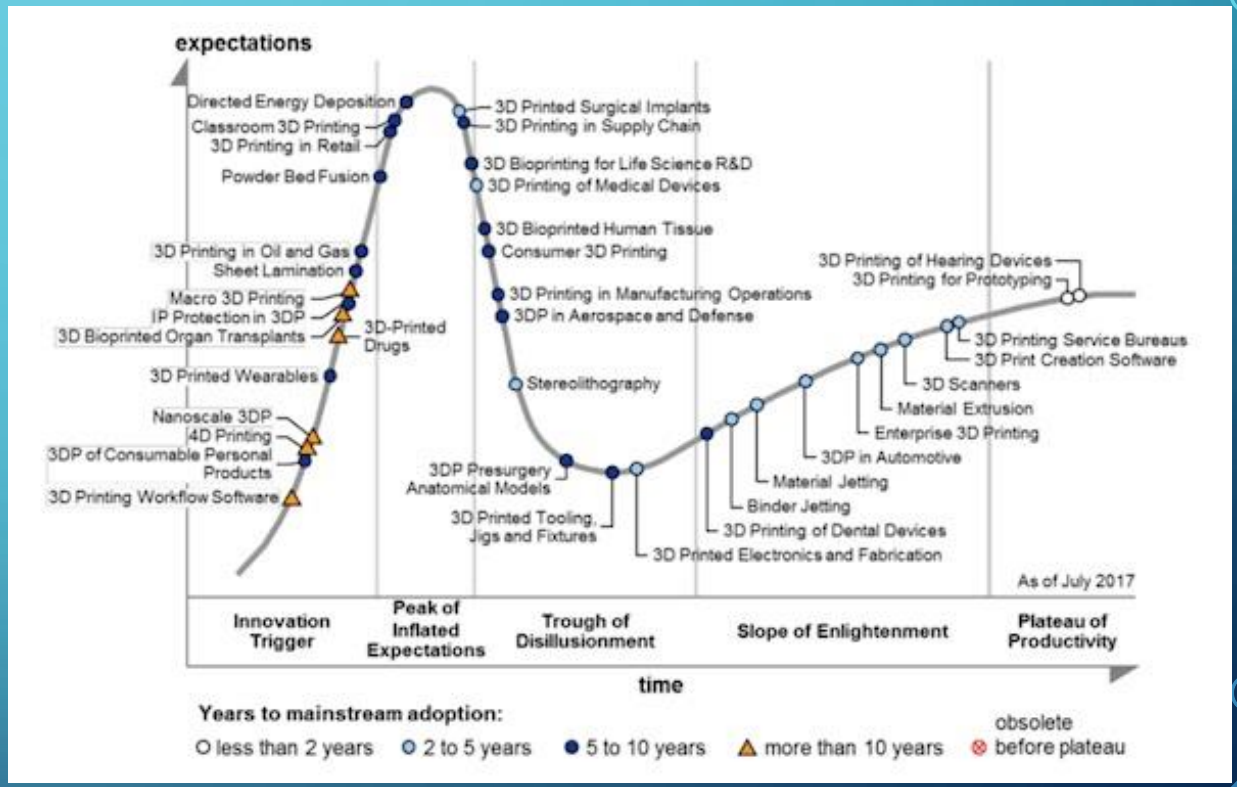
Source: National Training Laboratories, Bethel, Maine


Cable 1
Cable 2



DESARROLLO 3D PRINTING





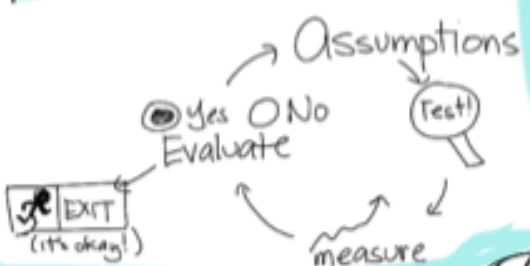
MaRS ENTREPRENEURSHIP 101 (#ENT101)

ENTREPRENEURIAL MANAGEMENT

JON E. WORREN

identify a sustainable business model with minimum waste

Customer problem → product solution? → business model



Step 0 Describe idea

write it down!

Thinking & talking → fuzzy

Step 1 Review assumptions

Ideally with someone else!

Measurable facts

focused efforts

$ clear impact

Step 2 Test

Key piece of information

validate assumption

invalidate

Running Lean

customer interviews → better for B2B but hard to do well! Most people are not good interviewers

Try doing 5D interviews.

Steps 3&4 Measure & Evaluate

willing to pay for it?

Especially:

early adopters (already paying for it!)

people already looking

Review your from Step 0

→ Validated?

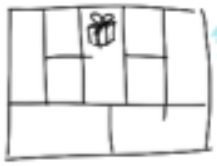
→ Iterate → change directions

→ Exit?

pivoting

easier when: low sunk costs, low traction, clear feedback, clear next step

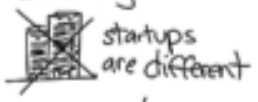
persist? → be honest!



Business model canvas

Value proposition → core

Summary



focused on learning

$ most will bootstrap

waste

Minimize risk by breaking up the process

Human element: have someone keep you accountable!

PROCESS > idea

Lean Startup

customer development + agile development

Q&A: Don't ask people to be your customers in your interviews! Asking w/o Selling

Managers plan, workers work.

Scientific management

Muda: waste

Hansei: learning

Kaizen: improvement

Jidoka: self-learning

Toyota Production System

Agile Development Manifesto

customer collaboration

Dev dev customer

fewer documents

more conversations

iterations

Lean thinking

From factories...

to all businesses

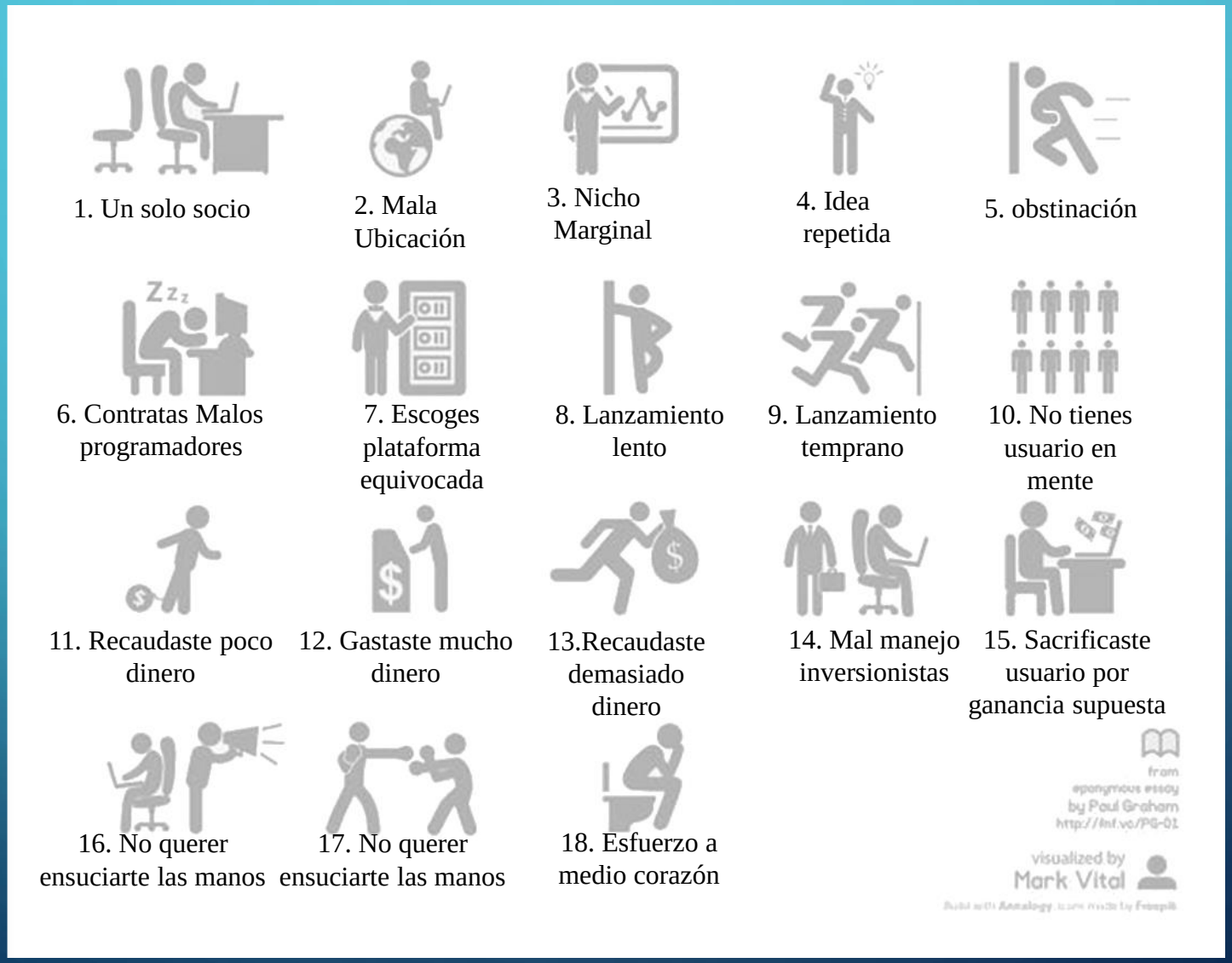
customer value

Customer Development

1. prioritizing business problems to solve
2. customer acquisition → scarcest resource, so understand the process
3. customer discovery → customer validation → customer creation → company building

Notes by: Sacha Chua (@sachac)
Check out more sketch notes at LivingAnAwesomeLife.com!

18 ERRORES QUE COMETEN LAS STARTUPS



CONCLUSIONES

- **Determinar cómo los Maker Labs contribuyen al desarrollo de los emprendedores.**

Los Maker Labs.

Centros de encuentro informal donde se pone en practica los conocimientos digitales y se validan las ideas.

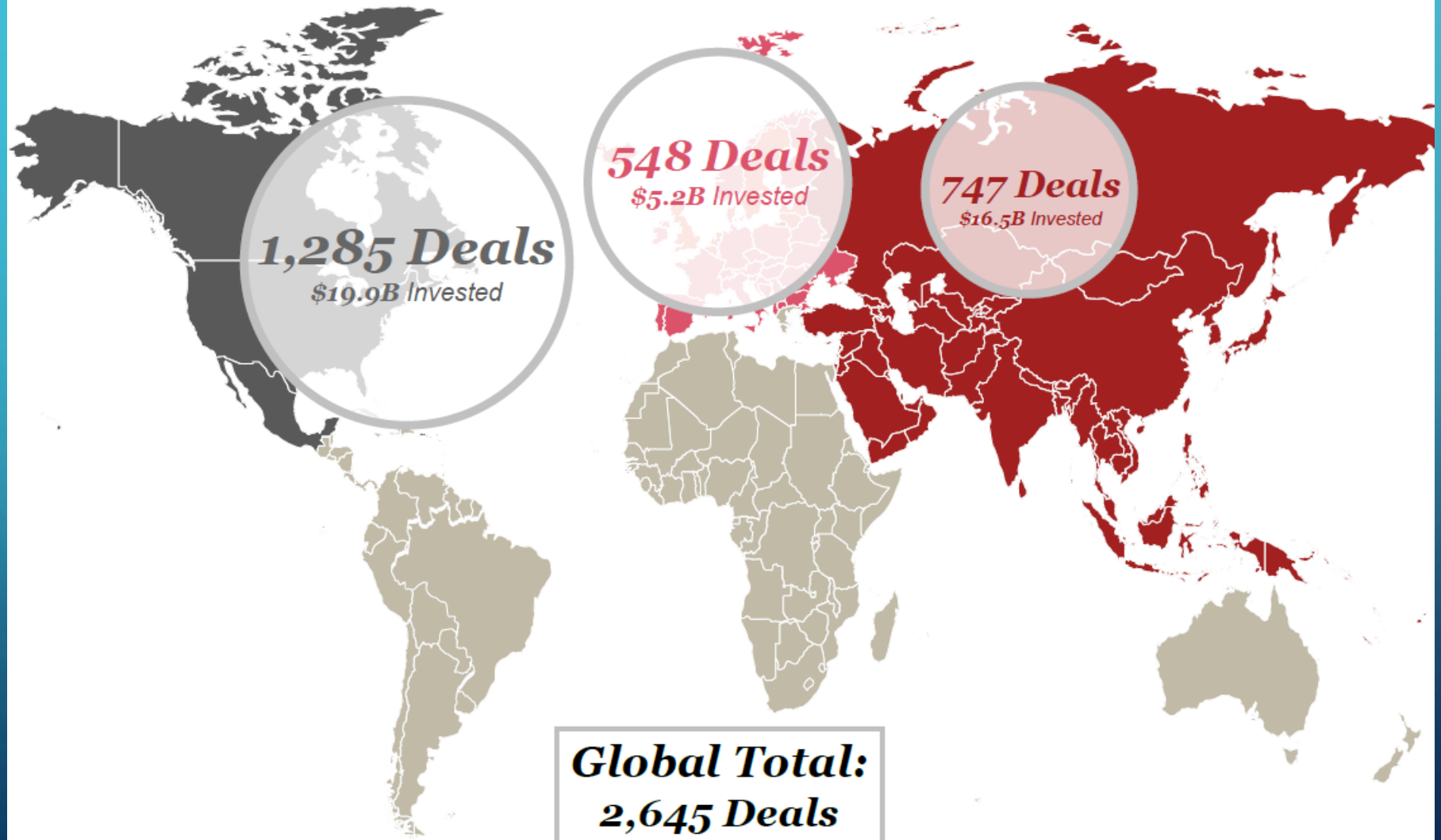
- **Identificar los aportes de la elaboración de prototipos como herramientas fundamentales en el desarrollo del emprendimiento.**

Los Maker Labs permiten el desarrollo de habilidades cognitivas y non cognitivas mediante la realización de prototipos. Colaboran con el individuo en el desarrollo de la autoeficacia.

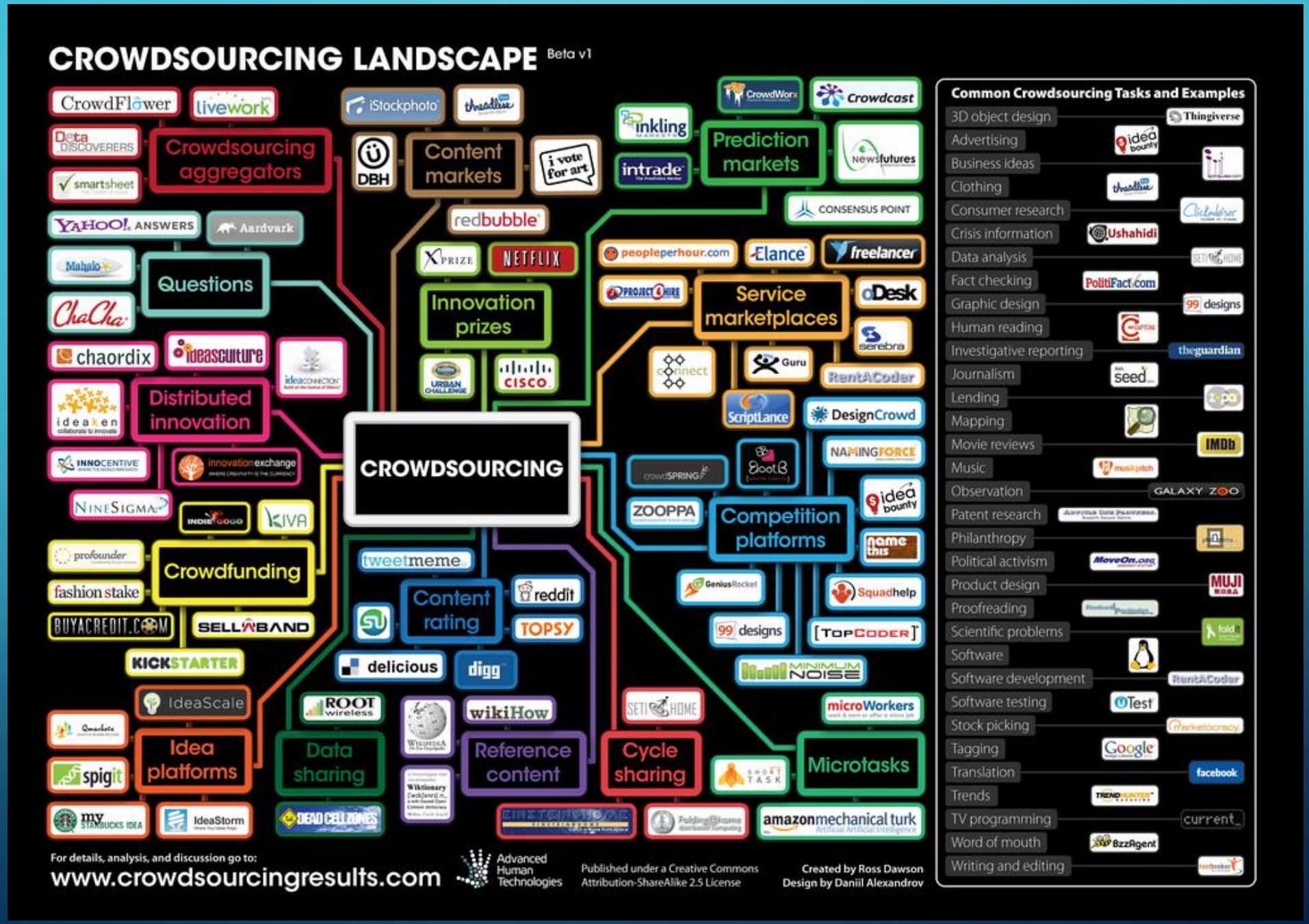
- **Investigar las tecnologías digitales e Identificar oportunidades de negocios para los emprendedores basados en la Cuarta Revolución Industrial.**

Piensa en Futuro, adaptas tecnologías y metodologías Digitales, realizas prototipos, aprendes de muchos errores, aceptas consumidor como jefe, ejecuta con rapidez y podrás hacer que lo imposible sea posible de manera exponencial.

Q3'17 Global regional comparison



Global Total:
2,645 Deals
$42.0B Invested


CROWDSOURCING LANDSCAPE Beta v1
CROWDSOURCING
Crowdsourcing aggregators
Questions
Distributed innovation
Crowdfunding
Idea platforms
Content markets
Innovation prizes
Prediction markets
Service marketplaces
Competition platforms
Content rating
Data sharing
Reference content
Cycle sharing
Microtasks
Common Crowdsourcing Tasks and Examples
3D object design
Advertising
Business ideas
Clothing
Consumer research
Crisis information
Data analysis
Fact checking
Graphic design
Human reading
Investigative reporting
Journalism
Lending
Mapping
Movie reviews
Music
Observation
Patent research
Philanthropy
Political activism
Product design
Proofreading
Scientific problems
Software
Software development
Software testing
Stock picking
Tagging
Translation
Trends
TV programming
Word of mouth
Writing and editing
For details, analysis, and discussion go to:
www.crowdsourcingresults.com
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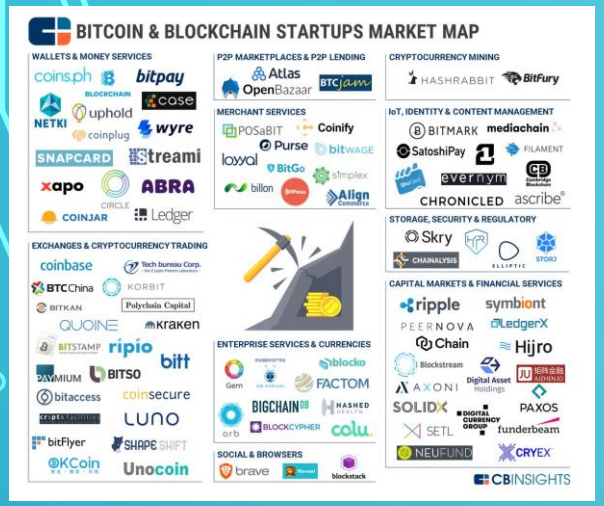
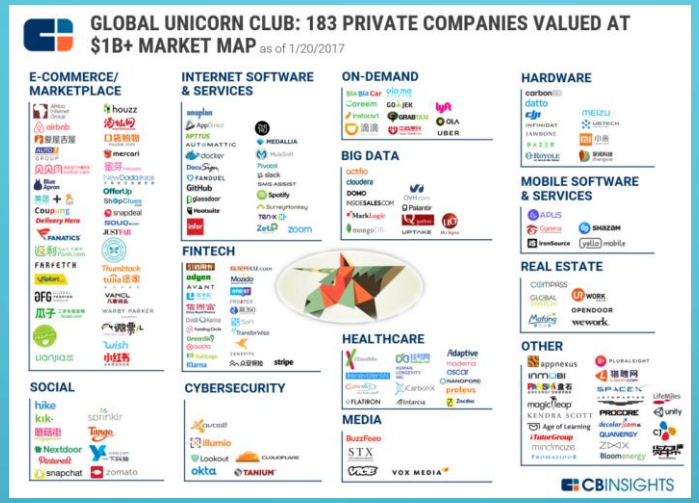
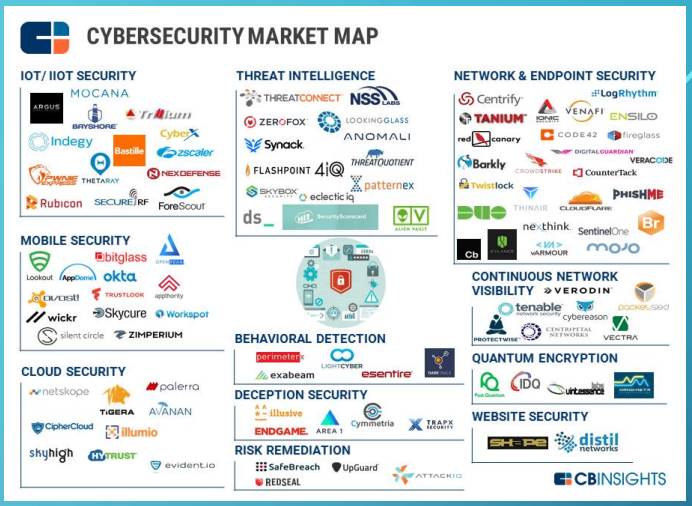
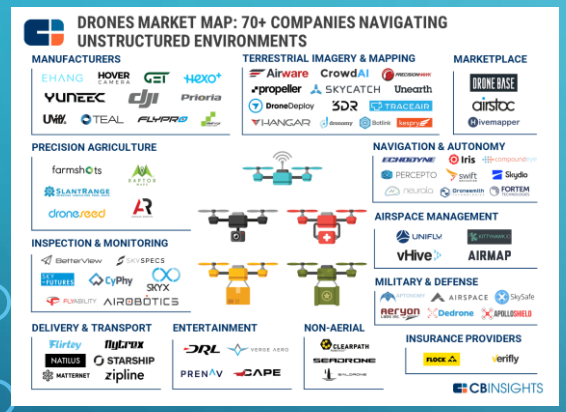
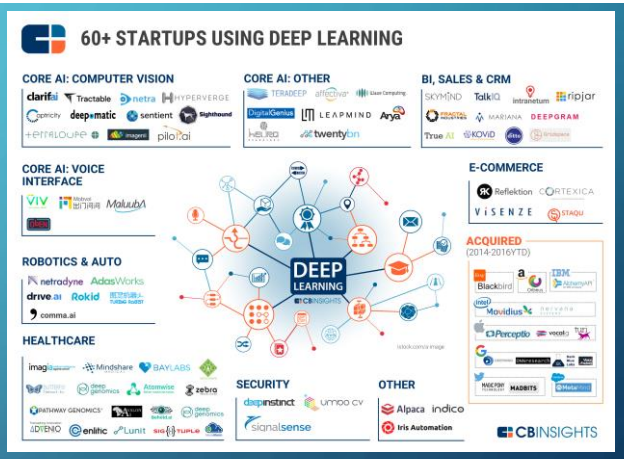
NUEVAS STARTUPS DISRUPTIVAS

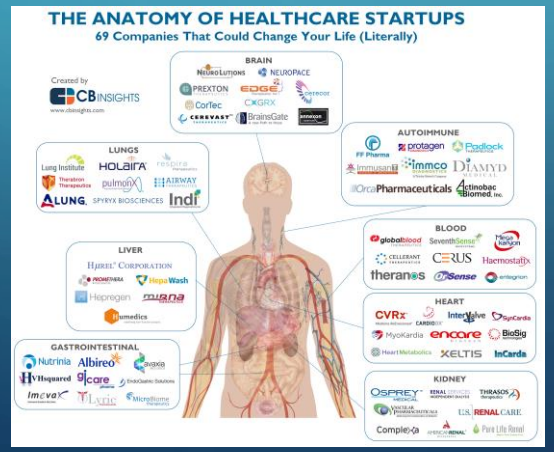


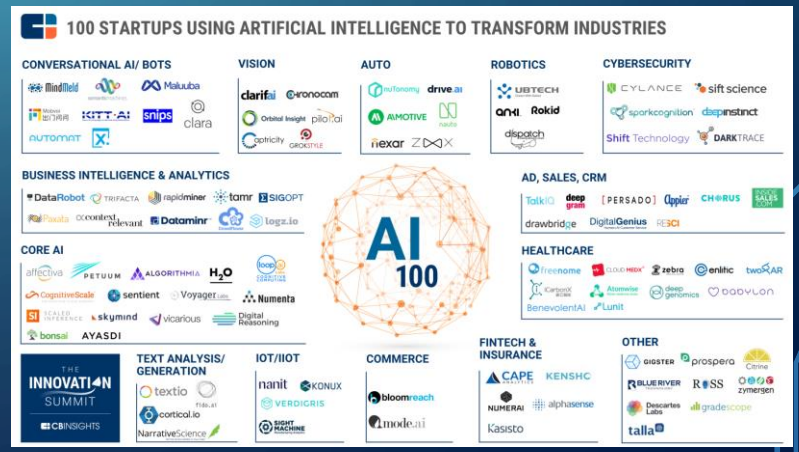












MUCHAS GRACIAS

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